

1st Workshop on Research Software Engineering (RSE)

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Software in Research – Research Software

- Netherlands eScience Center Strategy Paper “**Raising the Profile of Research Software: Recommendations for Funding Agencies and Research Institutions**”, ([DOI: 10.5281/zenodo.3378572](https://doi.org/10.5281/zenodo.3378572))
 - *“If open science is to truly lead towards better, more transparent, and reproducible research, then **research software needs to be treated in equal footing to research data and publications at the policy level and in practice.**”*

(Open
Source)
Research
Software =

- Key component of scientific work
- Software \approx data \approx devices
- Software = research infrastructure
- Valuable assets

**BETTER
SOFTWARE
BETTER
RESEARCH**

Sources: <https://www.software.ac.uk/about>

What is Research Software Engineering (RSE)?

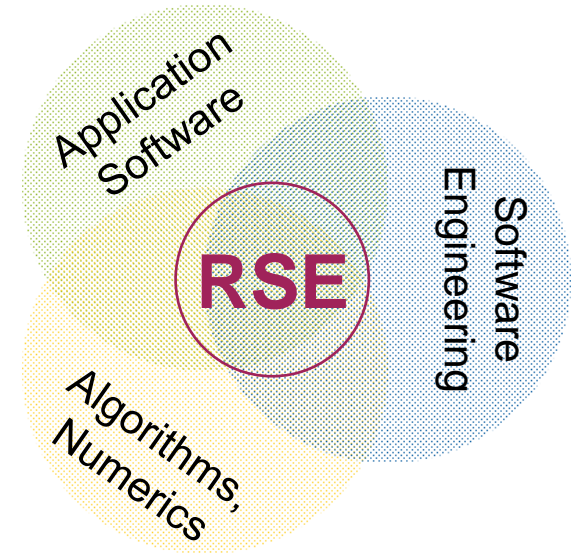
- **Research software engineering** is the use of [software engineering](#) practices in [research applications](#). The term was proposed in a research paper in 2010 in response to an empirical survey on tools used for software development in research projects.^[1] It started to be used in [United Kingdom](#) in 2012,^{[2][3]} when it was needed to define the type of software development needed in research. This focuses on [reproducibility](#), [reusability](#), and accuracy of data analysis and applications created for research.^[4]



Source: https://en.wikipedia.org/wiki/Research_software_engineering

What is Research Software Engineering (RSE)?

- **Software as research infrastructure**
(open, reliable, sustainable, reproducible)
- **Research Software Engineering**
as research and working area
- **Sustainable paradigm shift** through CI/CT/CD
(Continuous Integration/Testing/Delivery)
- **Education, training and promoting**
of young Research Software Engineers
- **Co-Design** through early integration of
computer scientists, mathematicians and
hardware-operators in the development of community codes (e.g., in
climate/environmental, materials or neuroscience)



- Aim 4 (Provision of overarching and sustainable information infrastructures):
“... **Software** will be recognized as **strategic infrastructure** for the transformation of data into knowledge and its long-term development will be funded in the context of open science, distribution and support...”
- Aim 5 (Fostering and strengthening research by usage of digital tools):
“...Helmholtz will (further) develop universally usable, scalable algorithms as well as **open source software** libraries for collecting, managing and analysing data, for modeling, simulation and optimization, for AI and ML...”
- Aim 9 (Digital cultural change):
„...employees, being involved in **software** and technology development and thereby enabling first-class research, must be highly recognized and valued as well as offered interesting career paths...”

Source: https://www.helmholtz.de/fileadmin/user_upload/publikationen/Digitalisierungsstrategie_DE_klein_FF.pdf

Research Software in the KIT Strategy 2025, Chapter 9 Digitalization

■ Aim 9.1.5 (Research Software):

”KIT understands **Research Software Engineering (RSE)** and the development of **research software** as an **essential task in the digitized research process** and strives for new research projects, which are increasingly data and computation intensive.”



■ **Subproject 9.1.4** (Caspart, Drees, Engelmann, Feuchter, Meyer, Streit)

- Measure 9.1.5.1: “Support and expansion of the Research Software Engineering (RSE)”
- Measure 9.1.7.1: “Promotion and transfer of innovative digital solutions (technologies, business ideas and foundations)”

Source: <https://www.sts.kit.edu/kits2025.php>

Aims of this Workshop

- Community building
- Knowledge exchange
- Requirements gathering
- Expectation management
- John F. Kennedy, inaugural address, 20th January, 1961:
“ask not what your country can do for you –
ask what you can do for your country”

